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ance to the bibliographer, but is hardly creditable to the spirit of scientific accuracy and fairness which American science has done so much to promote.

C. H. M.

The Mechanics of Pumping Machinery. By J. WEISBACH and G. HERRMANN. Authorized Translation by K. P. DAHLSTROM, M. E. Macmillan & Co. 1897. Pp. 300. 8vo. \$3.75.

This work is a translation of the latest division of the Weisbach cyclopedic treatise on Engineering Mechanics. It is intended mainly as a text-book, and for use in advanced courses of instruction in engineering schools; while it is also thought that it may have value to the designer and constructor in his daily work. The translator has added some matter exhibiting the progress made in this field since the original publication of the book in Germany, and in this he has had the aid of Professor Klein's notes. The work includes discussions of early forms of water elevators and hydraulic machinery, of the theory and action of pumps, both reciprocating and rotary, and an account of other less well-known apparatus for raising water. The reputation of the author, Professor Herrmann, the distinguished technician, is a guarantee of the reliability of these discussions, and this guarantee is confirmed by examination of the pages of this translation, in which these discussions have been faithfully brought over into the English and in satisfactory form.

The illustrations are numerous and helpful; the text is by them rendered admirably lucid. In general appearance and style the volume corresponds to its predecessors in the same series and, without being elegant, is creditably made up. Its price is moderate and it will probably find its place in the library of all who possess its companion volumes.

R. H. T.

SCIENTIFIC JOURNALS.

THE JOURNAL OF COMPARATIVE NEUROLOGY.
VOL. VII., NO. 1.

THE issue for April contains three memoirs, besides editorials and reviews. B. F. Kingsbury writes on 'The Structure and Morphology

of the Oblongata in Fishes,' from the standpoint of the components of the nerve roots. Some 17 species of cartilaginous and bony fishes were examined, their nerve roots analyzed and the components traced to their respective centers, along the lines laid down by Strong's recent work on the cranial nerves of Amphibia. It will be remembered that Strong reduces the sensory nerves of the head to three types: (1) the general cutaneous system, innervating the skin and terminating in the 'ascending' or spinal fifth tract of the medulla; (2) the acustico-lateral system, innervating the lateral line canals and the ear and terminating in the tuberculum acusticum of the medulla; (3) the fasciculus communis system, innervating taste buds, certain specialized end-organs of the skin not belonging to the lateral line system, and the mucous and visceral surfaces in general, and terminating in the fasciculus communis of the medulla, or the cellular aggregates associated with it (lobus vagi of fishes).

Now in the fishes examined, Dr. Kingsbury finds these components present, and arranged in essentially the same way as in the Amphibia. The varied and apparently anomalous conditions found in the medulla of the fishes, which have so long puzzled the morphologists, have been reduced for the most part to variations in the relative development of these three factors. The lobus trigemini of the catfishes is regarded as a specialized portion of the fasciculus communis system. These conclusions have been reached by a study of the central relations only of the nerve roots. It may be added that researches now in progress at Columbia University, upon the peripheral distribution of these roots in the bony fishes, have fully substantiated most of his discoveries.

Dr. Kingsbury follows with a second paper entitled 'The Encephalic Evaginations in Ganoids.' The new and important points are two: (1) The presence in the adult *Amia* of the first epiphysal vesicle of Hill and its innervation from the left Habena; and (2) the existence in *Amia* and *Lepidosteus* of lateral cephalic and caudal extensions of cavity caudad of the velum transversum of Kupffer, constituting considerable diverticula.

'The Early Development of the Epiphysis and

Paraphysis in Amia, by A. C. Eycleshymer and B. M. Davis. This paper describes and fully illustrates the early development of the same structures treated in the preceding article; each, therefore, supplements the other. The first vesicle of Hill (*i. e.*, the smaller more cephalic vesicle and the one termed 'secondary vesicle' by Eycleshymer and Davis) arises as an evagination from the dorsal wall of the other vesicle and some four or five days later.

It then shifts to the left side (occasionally to the right) and in one instance was seen to receive nerve fibers from the superior commissure. A critical review of the theories of the relation of the epiphysial outgrowths to the segmental sense organs follows.

The editor-in-chief gives a few aphorisms on 'The Ethics of Criticism,' which, though trite, are not, perhaps, wholly unnecessary.

SOCIETIES AND ACADEMIES.

CHEMICAL SOCIETY OF WASHINGTON; THE 94TH REGULAR MEETING, MARCH 11.

The first paper, 'Some Theories of Crystal Structure,' was by Mr. Wirt Tassin. After reviewing earlier hypothesis the author took up the more recent structural theory of Federow and Schonflies, which requires only that the structure of the crystal consist of similar molecules and allows the chemist and the physicist to decide the character of these molecules. It was pointed out that the essential difference between the Sohnckian hypothesis and that of Schonflies was that Sohncke requires that, in a system of points which is to have the characters required by a crystal structure, around every point the arrangement of the remainder is the same as around every other point; and all of his structures are derived by moving one point to another by sliding, rotating and screw motions. Schonflies, on the other hand, defines a crystal as 'consisting of absolutely similar molecules, so arranged that each molecule is environed in the same way by all the other molecules,' so that one part of the system may be derived from the other by reflection. Mention was made of Harlow's work and examples given, and the paper closed with a list of predictions of new compounds which have been

verified and which were based upon theories treating of the relations between form, structure and composition.

As a supplement to Mr. Tassin's paper, Dr. F. K. Cameron read a short résumé on 'The Effect of Substitution on Isomorphism and Crystal Structure in Organic Compounds.' Substitution may cause the system to increase or diminish in symmetry or may cause the lengthening or shortening of axes. With the substitution of one or a few atoms by other atoms or groups the system generally changes and to one of less symmetry. If all, or nearly all, the equivalent atoms or groups are placed alike the derivative generally regains the symmetry of the original substance. The effect of substitution on crystal structure was illustrated by a comparison of the benzol and of the ammonium platino-chloride compounds. Neither (OH) nor (NO₂) seem to have much morphotropic value. Repeated substitution in the platino-chlorides often restores the symmetry of the mother substance, but the substitution of ethyl brings about a complete change.

Messrs. Wm. H. Krug and J. E. Blomen presented a paper, entitled 'A Recalculation of Wein's Table of Starch Equivalent to Copper Found Based on the Factor 0.92.' Starch or dextrine can be directly obtained from the copper found by converting the starch into dextrine and determining the latter with Allihn's solution. This table is based on the factor 0.90, which assumes that the formula of starch is (C₆H₁₀O₅)_n and that it is all converted into dextrose. Nægelli determined the formula of starch to be C₃₆H₆₂O₃₁ and if this is correct the factor becomes 0.918. Ost, working with the Sacchse method, decided upon the factor 0.925. In view of all these conflicting data Wiley recommends the factor 0.92, a man between the two last cited, which will give the analyst fairly accurate results. This factor has been used in the recalculation of the table.

The last paper, entitled 'Malt Wine,' was read by Dr. D. J. Kelly. He pointed out how Ordonneau, Jacquemin, Tettelin, Rommier and Sauer recognized the profound changes produced in the fermentation of a sweet liquid according to the kind of ferment employed. They found that when the juice of